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A systematic review of knowledge, attitude, perception, burden, and impact of menstrual period on mental health and well-being of women of reproductive age in Nigeria

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Abstract

Menstrual health remains a neglected yet critical determinant of mental and physical well-being among women of reproductive age in resource-limited settings, including Nigeria, where persistent stigma, inadequate knowledge, and material deprivation converge to amplify vulnerability to psychological distress. This systematic review systematically mapped and thematically synthesized peer-reviewed evidence on the knowledge, attitudes, perceptions, burden, and mental health impact of menstruation among Nigerian women of reproductive age (15-49 years), identifying key gaps to inform policy, practice, and future research.

A systematic search of PubMed, Scopus, AJOL, Springer, ScienceDirect, and Google Scholar was conducted for primary studies (cross-sectional, qualitative, mixed-methods, and quasi-experimental) published between January 2015 and December 2025. Findings were synthesized thematically.

Twenty-eight studies met the inclusion criteria, spanning six geopolitical zones of Nigeria. Five overarching themes were identified: persistent knowledge deficits regarding menstrual physiology, especially in rural areas; prevailing negative attitudes, stigmatization, and cultural restrictions; high prevalence of menstrual disorders, particularly dysmenorrhea and premenstrual syndrome; substantial mental health burden, including depression, anxiety, low self-esteem, and social withdrawal; and marked educational disruption, with reporting school absenteeism during menstruation.

The evidence reveals a cyclical relationship wherein inadequate knowledge fuels stigma, which in turn exacerbates psychological distress, educational disruption, and diminished quality of life. Despite growing policy recognition, fragmented data and limited geographical reach constrain generalizability. Rigorous longitudinal and interventional research is urgently needed to inform scalable, evidence-based solutions.

Key words: menstruation, menstrual period, menstrual hygiene, mental health, reproductive health, Nigeria.

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Introduction

Menstruation is a fundamental physiological process that marks the commencement of reproductive capacity in women and girls, occurring in an estimated 1.8 billion individuals globally each month.[1] Despite its biological universality, menstruation is deeply entangled with socio-cultural norms, economic constraints, and gender-based inequities that collectively shape the lived experience of menstrual health management.[2] The World Health Organization and the United Nations have increasingly recognized menstrual health as a public health priority and a matter of human rights, highlighting the need for comprehensive approaches that extend beyond hygiene management to encompass the psychosocial dimensions of menstruation.[3] Globally, an estimated 500 million women and girls lack access to adequate menstrual products, clean water, and private sanitation facilities necessary for dignified menstrual management.[4] The burden is disproportionately borne by those in low- and middle-income countries (LMICs), where cultural taboos, inadequate infrastructure, and limited health literacy converge to create a landscape of menstrual inequity.[5]

In these settings, menstruation is not merely a biological event but a socially constructed experience laden with shame, secrecy, and restriction that can profoundly impact mental health, educational attainment, and overall quality of life (QoL).[6] The silence surrounding menstrual discourse perpetuates misinformation, reinforces gender inequality, and limits opportunities for women and girls to reach their full potential.[7] Mental health implications of menstruation have garnered increasing research attention, particularly concerning premenstrual syndrome (PMS), premenstrual dysphoric disorder (PMDD), and menstrual-related psychological distress.[8] Hormonal fluctuations across the menstrual cycle, including estrogen and progesterone variations, are known to influence neurotransmitter systems implicated in mood regulation, potentially contributing to premenstrual mood disturbances and

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increased vulnerability to anxiety and depression.[9] Beyond the biological mechanisms, the psychosocial burden of menstruation, including stigma, material deprivation, pain, and social exclusion, can independently contribute to mental distress, particularly among adolescents and young women.[2]

Sub-Saharan Africa, including Nigeria, represents a region where menstrual health challenges are particularly acute due to the intersection of poverty, cultural norms, weak health systems, and insufficient access to education and WASH (Water, Sanitation, and Hygiene) facilities.[10] Nigeria, Africa's most populous country with over 220 million people and an estimated 47 million women of reproductive age (15-49 years), presents a unique but understudied context for menstrual health research.[11] The country's diverse cultural landscape, with over 250 ethnic groups, substantial urban-rural disparities, and varying levels of socioeconomic development, creates heterogeneous menstrual health experiences that remain inadequately documented in the scientific literature.[12] Period poverty, defined as the inability to afford or access adequate menstrual products and facilities, affects approximately 37 million Nigerian women and girls, with devastating consequences for their health, dignity, and opportunities.[13] Studies have reported that 23% of adolescent girls in Nigeria miss school during menstruation due to inadequate facilities, stigma, and fear of staining.[12] The financial burden of menstrual products, which can cost between N1000 and N2000 monthly in a context where many households live on less than $2 per day, forces many women and girls to resort to unsanitary alternatives such as rags, tissues, leaves, and even cow dung, increasing the risk of reproductive tract infections and psychological distress.[14,15]

The cultural context of menstruation in Nigeria is characterized by pervasive stigma, secrecy, and restrictive practices rooted in traditional and religious beliefs about purity and pollution.[4] These beliefs often manifest as restrictions on social interactions, food preparation, and religious participation during menstruation, reinforcing feelings of shame and marginalization.[16] The concealment of menstruation from male family members, including fathers, is a common practice in many Nigerian communities, perpetuating a cycle of silence that impedes open discussion and access to accurate information.[17] Despite growing global recognition of menstrual health as a determinant of well-being, research specifically examining the intersection of menstruation and mental health among Nigerian women of reproductive age remains fragmented and insufficiently synthesized. Existing studies have predominantly focused on menstrual hygiene management and school absenteeism among adolescents, with limited attention to the psychological dimensions of menstrual experience across the reproductive lifespan.[14,15] The relationship between menstrual pain disorders, such as dysmenorrhea, and common mental disorders, including anxiety and depression, has been examined in a few isolated studies, yet no systematic synthesis of this evidence has been conducted to inform policy and practice.[18] This systematic review, therefore, sought to comprehensively map the existing peer-reviewed evidence on knowledge, attitudes, perceptions, burden, and the impact of menstruation on mental health and well-being among women of reproductive age in Nigeria. The review was guided by a broad research question: what is known from the peer-reviewed literature about how menstruation affects the mental health and well-being of Nigerian women of reproductive age, and what factors shape these outcomes? By synthesizing findings across studies, the review aimed to identify common themes, methodological strengths and limitations, and critical evidence gaps requiring further investigation.

Objectives of the study

This systematic review systematically mapped and thematically synthesized peer-reviewed evidence on the knowledge, attitudes, perceptions, burden, and mental health impact of menstruation among Nigerian women of reproductive age (10-49 years), identifying key gaps to inform policy, practice, and future research. Specific objectives were the following: i) to map the available peer-reviewed evidence on menstrual-related knowledge, attitudes, and perceptions among women of reproductive age in Nigeria; ii) to synthesize findings on the prevalence and burden of menstrual disorders and their psychosocial impact; iii) to examine the reported associations between menstrual experiences and mental health outcomes, including depression, anxiety, and psychological well-being; iv) to identify the factors (individual, socio-cultural, economic, and structural) that mediate the relationship between menstruation and mental health in the Nigerian context; v) to identify critical gaps in the existing literature and propose directions for future research, policy, and practice.

Methods

Study design

A systematic review was conducted following the methodological framework established by PRISMA 2020 guideline and Hilton *et al*., with reporting guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Systematic Reviews (PRISMA-SR).[19-21]

Information sources

A comprehensive search was conducted across six electronic databases: PubMed (including MEDLINE), Scopus, AJOL, SpringerLink, ScienceDirect, and Google Scholar. The search was supplemented by manual review of the reference lists of included studies and forward citation tracking using Google Scholar to identify additional relevant publications. The search was initially conducted in March 2025 and updated in April 2026 to capture the most recent publications.

Search strategy

The search strategy combined Medical Subject Headings (MeSH) terms and free-text keywords. An example of the search strategy adapted for each database is as follows: "menstruation" OR "Menstrual Hygiene Products" OR "Dysmenorrhea" OR "premenstrual syndrome" OR "menstrua" OR "menstrual" OR "period poverty" AND "health knowledge, attitudes, practice" OR "knowledge" OR "attitude" OR "perception" OR "stigma" OR "belief" AND "mental health" OR "mental health illness" OR "depression" OR "anxiety" OR "quality of life" OR "mental" OR "depress" OR "anxiety" OR "wellbeing" OR "distress" OR psychological AND "Nigeria" OR "Nigerian".

Eligibility criteria

Inclusion criteria

Inclusion criteria consist of:

- population: women of reproductive age (10-49 years) residing in Nigeria, including adolescents (10-19 years) and adults (20-49 years), with or without menstrual disorders. Studies focusing on pregnant or postmenopausal women exclusively were excluded

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unless they contained relevant data on menstrual history and its psychosocial impact;
- phenomena of interest: knowledge, attitudes, perceptions, beliefs, and practices related to menstruation; prevalence and burden of menstrual disorders (dysmenorrhea, PMS, menstrual irregularities); psychosocial impact of menstruation, including mental health outcomes (depression, anxiety, stress, self-esteem, QoL); and factors influencing these relationships;
- study design: all peer-reviewed primary research designs including cross-sectional surveys, case-control studies, qualitative studies (phenomenology, ethnography, grounded theory), mixed-methods studies, cohort studies, and quasi-experimental studies;
- publication type: articles published in English-language peer-reviewed journals between January 2015 and December 2025;
- geographic focus: studies conducted exclusively in Nigeria or including geographically distinct data for Nigeria within multi-country studies.

Exclusion criteria

Exclusion criteria consist of systematic reviews, scoping reviews, meta-analyses, narrative reviews, and opinion pieces; conference abstracts, editorials, commentaries, and letters to the editor; studies conducted among Nigerian diaspora populations outside Nigeria; studies focusing exclusively on menstrual health among women with HIV or cancer unless they reported mental health or psychosocial outcomes; studies with insufficient methodological detail to extract usable data; studies published before 2015 or after the search date.

Study selection and screening

Two reviewers independently screened titles and abstracts against the eligibility criteria. Full texts of potentially eligible studies were retrieved and independently assessed by both reviewers. Discrepancies at any stage were resolved through discussion and, where necessary, consultation with a third reviewer. The study selection process was documented using a PRISMA flow diagram (Figure 1).

Data extraction and synthesis approach

A standardized data extraction form was developed in Microsoft Excel, piloted on five randomly selected studies, and refined accordingly. The following data were extracted from each included study: authors, year of publication, study objective(s), study design, geographic setting (state and geopolitical zone), population characteristics, sample size and sampling, key findings, and conclusions.

Risk of bias assessment

The methodological quality of the included studies was appraised using the Mixed Methods Appraisal Tool (MMAT) version 2018 to inform the interpretation of findings and identify methodological limitations of the existing evidence base.[22] The MMAT was selected because it accommodates the diversity of study designs included in this review. Each study was rated on a scale of high, moderate, or low quality based on adherence to methodological standards appropriate to the study design. *Supplementary Table 1* presents the risk of bias assessment of the included studies.

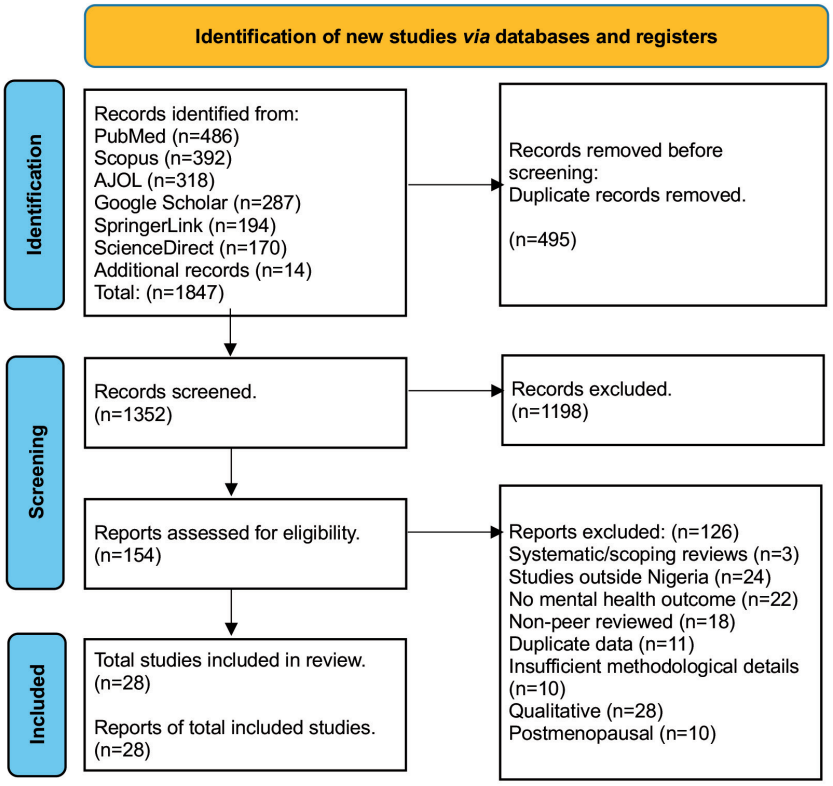

Figure 1. Diagram of the PRISMA 2020 process for systematic reviews and meta-analyses.

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Results

Study selection

A total of 1847 records were identified through database searching, with an additional 14 records identified through reference list and citation searching. After removing duplicates, 1352 records were screened at the title and abstract level, of which 1198 were excluded. The full texts of 154 articles were assessed for eligibility, resulting in the exclusion of 126 articles. The primary reasons for exclusion were systematic or scoping review designs (n=31), studies conducted outside Nigeria (n=24), not reporting mental health or psychosocial outcomes (n=22), non-peer-reviewed sources (n=18), duplicate data (n=11), insufficient methodological detail (n=10), and population outside reproductive age or exclusively pregnant/postmenopausal (n=10). Ultimately, 28 studies met the inclusion criteria and were included in the synthesis. The selection process is depicted in the PRISMA flow diagram in Figure 1.

Characteristics of included studies

The 28 included studies spanned the period from 2017 to 2025, with the majority published between 2022 and 2025, reflecting recent growth in attention to menstrual health in Nigeria.[4,14-16,18,23-45] The studies were conducted across all six geopolitical zones of Nigeria, with the highest representation from the South-West, followed by the North-West, the South-South, the South-East, the North-Central, and the North-East. No studies were identified from the North-West exclusively for mental health outcomes related to menstruation, though the zone was represented in knowledge and practice studies. Regarding study design, the majority employed cross-sectional surveys, reflecting the predominant research approach in this field. Sample sizes varied considerably, ranging from 25 to 1250. The total number of participants across all included studies exceeded 14,000. The predominant study settings were secondary schools, followed by universities, community-based settings, and healthcare facilities. *Supplementary Table 2* presents the characteristics of the included studies.

The most commonly employed instruments for assessing knowledge and attitudes were self-administered structured questionnaires adapted from, or inspired by, the UNICEF Menstrual Hygiene Management tools and previous local studies. Mental health outcomes were assessed using validated scales, including the Generalized Anxiety Disorder-7, Beck Depression Inventory, Perceived Stress Scale, Rosenberg Self-Esteem Scale, World Health Organization Quality of Life Brief Version, and the Menstrual Distress Questionnaire. Studies examining PMS and dysmenorrhea predominantly used the Diagnostic and Statistical Manual of Mental Disorders criteria or self-report instruments validated in local populations.

Quality appraisal of included studies

Methodological quality varied across the included studies. Based on the MMAT assessment, 14 studies were rated as high quality, and 14 studies as moderate quality. Common methodological strengths included the use of validated instruments for measuring mental health outcomes, adequate sample sizes with clearly described sampling strategies, and appropriate statistical analyses including multivariable regression to adjust for confounders. Mixed-methods designs that integrated quantitative surveys with focus group discussions provided richer contextual data. Recurrent limitations included reliance on convenience sampling, single-site study designs limiting external validity, self-reported outcome measures subject to recall and social desirability bias, and limited adjustment for potential confounders in several cross-sectional studies. The qualitative studies generally demonstrated rigor in data collection and analysis, though small sample sizes in some studies limit transferability of findings. *Supplementary Table 1* presents the quality assessment score of the included studies.

Thematic synthesis/key themes

The synthesis of findings from the 28 included studies revealed five overarching themes that collectively depict the multifaceted relationship between menstruation and mental health among Nigerian women of reproductive age.[4,14-16,18,23-45] These themes include: i) knowledge deficits and sources of information; ii) attitudes, stigma, and cultural constructions of menstruation; iii) burden of menstrual disorders and pain; iv) mental health and psychosocial consequences; and v) educational and occupational disruption.

Knowledge deficits and sources of information

A consistent pattern across the included studies is the substantial gap in menstrual knowledge among Nigerian women and adolescent girls, with variation across geographic location, school type, maternal education, and socioeconomic status. In Nasarawa West Senatorial Zone, poor menstrual hygiene knowledge affected over 50% of secondary school students, with limited physiological understanding, as only a few recognized that bleeding is not the only phase of the menstrual cycle.[28] Maternal education was strongly associated with knowledge levels, with markedly higher odds of good knowledge among students whose mothers had tertiary education compared to those with no formal education. Urban residence and private school attendance were also associated with improved knowledge, indicating persistent structural inequalities in menstrual health literacy.

A similar rural-urban disparity is evident in Cross River State, where poor knowledge affected rural adolescents when compared with adolescents in urban settings.[24] Earlier menarche was also more common in rural schools, suggesting that rural girls often transition into menstruation with less preparatory information. However, variations exist across settings. High knowledge levels were observed among adolescent girls aged 10-19 years in Cross River State, although a substantial proportion still expressed resignation toward menstruation, indicating it was something to be tolerated due to lack of choice.[4] In Abuja, quite number of students demonstrated good knowledge, with higher odds among students in junior secondary school and those with later menarche.[3,23] In contrast, no significant age or educational differences in knowledge were observed among university students in Gombe, suggesting that educational advancement alone does not guarantee improved menstrual literacy.[25]

Across studies, mothers and female relatives consistently emerged as the dominant sources of menstrual information.[24,28,35] Despite this central role, the quality of information was often limited by maternal misconceptions and the transmission of cultural restrictions alongside biological explanations. The implications of these knowledge gaps extend to psychological well-being. Inadequate knowledge is associated with fear, confusion, and anxiety at menarche.[35] In rural Ibadan, incomplete menstrual education contributed to emotional distress and negative coping responses among adolescents.[16] Limited access to comprehensive sexuality education further exacerbates these outcomes, reinforcing psychological vulnerability during menarche and menstruation.

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Attitudes, stigma, and cultural constructions of menstruation

Menstrual attitudes among Nigerian women and girls reflect a complex interaction of cultural, religious, and social norms, with predominantly negative constructions persisting across many contexts. A substantial proportion of adolescents expressed resignation toward menstruation, indicating that it is something to be tolerated, alongside widespread endorsement of restrictive cultural practices, including avoidance of sharing spaces or items with menstruating females.[4] These attitudes are reinforced by cultural norms that position menstruation as taboo and socially inappropriate for open discussion. In contrast, more positive attitudes were observed in Abuja, where adolescent girls demonstrated favorable menstrual hygiene attitudes.[23] Positive attitudes were more common among students in higher classes, those from highly educated households, and certain religious groups, highlighting the influence of sociodemographic factors. Gendered differences were also evident in university populations, with statistically significant variation observed only in the "pleasant" dimension of menstrual attitudes, where females reported more positive perceptions than males.[40] This underscores the relevance of male-targeted menstrual education in addressing stigma and social exclusion.

Religious beliefs significantly shape menstrual experiences and perceptions. Variations in doctrine and practice contribute to menstrual restrictions, including limitations on prayer, fasting, and participation in religious activities.[34] While culturally embedded, such restrictions are associated with emotional outcomes such as shame, exclusion, and reduced self-worth, particularly when strictly enforced. The psychosocial burden of stigma is evident in qualitative accounts of adolescent experiences, where menstrual staining and fear of ridicule contribute to depressive symptoms and social withdrawal.[16] Fear of embarrassment also emerges as a significant predictor of school absenteeism.[33] Body image and self-esteem further mediate menstrual attitudes, with lower anxiety and higher body esteem associated with more positive menstrual perceptions.[41] These findings indicate that menstrual experiences are shaped by interacting psychological and sociocultural processes.

Burden of menstrual disorders and pain

Menstrual disorders, particularly dysmenorrhea and PMS, are highly prevalent among Nigerian women and girls, with significant implications for daily functioning and mental well-being. Dysmenorrhea prevalence ranges from 64% to 85% across studies.[29,30,32,37,42] In university populations, prevalence is consistently high, with associated symptoms including low mood, headache, dizziness, depression, and social withdrawal.[29,42] Functional impairment is common, affecting routine work, sleep, and social engagement.[30] Among secondary school girls, dysmenorrhea contributes to measurable educational disruption, including absenteeism.[37] In some cases, severe dysmenorrhea significantly predicts school absence, while menstrual duration influences symptom severity. Menstrual disorders also cluster, with co-occurrence of amenorrhea, menorrhagia, and irregular cycles observed alongside dysmenorrhea, indicating broader reproductive health instability.[32]

PMS prevalence is similarly high, affecting over three-quarters of adolescents in some settings.[14] Physical symptoms such as dysmenorrhea and emotional symptoms such as mood swings are prominent. Health-seeking behavior remains low, with only a minority seeking medical evaluation, reflecting normalization of menstrual discomfort. PMS is also strongly associated with school absenteeism and reduced academic performance, particularly through mood-related symptoms.[15] PMDD, though less common, affects a clinically significant minority of female undergraduates, with associations including painful menstruation, neuroticism, and older age.[39] Together, these findings indicate a spectrum of menstrual-related conditions with varying severity but consistent functional and psychological consequences.

Mental health and psychosocial consequences

Evidence across studies indicates a strong association between menstruation-related conditions and mental health outcomes, including anxiety, depression, stress, low self-esteem, and psychological distress. Dysmenorrhea severity is positively associated with multiple mental health dimensions, with anxiety demonstrating the strongest influence, followed by depression and self-esteem.[18] These associations are further intensified in contexts of unsatisfactory parental relationships, indicating a moderating role of family dynamics. Low mood and depressive symptoms are frequently reported among individuals experiencing dysmenorrhea, with social withdrawal also documented during menstruation.[29,30,42] Qualitative evidence highlights anticipatory anxiety linked to fear of menstrual staining and social embarrassment, contributing to ongoing psychological strain.[16]

Period poverty further exacerbates mental health burden. Limited access to menstrual products and facilities creates persistent stress and anxiety, particularly during crises such as the COVID-19 pandemic.[36] Economic constraints have also been linked to high-risk coping strategies, including transactional sex, with subsequent exposure to additional psychological and physical health risks. Religiosity also contributes to psychological outcomes, influencing menstrual experiences and emotional well-being.[34] Psychological resilience factors, including body esteem and lower anxiety, are associated with more positive menstrual attitudes and may buffer against adverse mental health outcomes.[41]

Educational and occupational disruption

Menstruation significantly disrupts educational participation and occupational functioning across adolescent and young adult populations. Absenteeism due to dysmenorrhea ranges from 13.1% to 32.5%, depending on context.[37,43] Severe menstrual pain is a consistent predictor of school absence, while PMS-related mood disturbances further increase absenteeism risk.[14] Beyond absenteeism, menstruation negatively affects concentration, classroom participation, and engagement in extracurricular activities.[37] Inadequate access to sanitary products and poor WASH infrastructure are key structural drivers of school absenteeism, with economic disadvantage further compounding these challenges.[33]

Among university students, dysmenorrhea impairs routine work and sleep quality, extending its impact beyond academic settings into broader functional domains.[30] These disruptions cumulatively affect productivity and long-term educational attainment, with potential implications for future economic empowerment and gender equity.

Discussion

This systematic review provides the first comprehensive synthesis of peer-reviewed evidence on the multidimensional relationship between menstruation and mental health among women of reproductive age in Nigeria. Evidence from 28 primary studies

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demonstrates a consistent convergence across five domains: inadequate menstrual knowledge, pervasive stigma and negative attitudes, high burden of menstrual disorders, substantial mental health consequences, and significant educational disruption.[4,14-16,18,23-45] Collectively, these findings indicate an interrelated system of menstrual disadvantage in which biological, psychological, and structural factors interact to reinforce cycles, necessitating integrated multilevel interventions.

Knowledge, education, and the information ecosystem

Menstrual knowledge deficits remain widespread, with poor knowledge levels ranging between 59% and 82.6% among adolescent girls.[28] This pattern aligns with broader Sub-Saharan African evidence but reflects context-specific challenges in Nigeria, including linguistic and ethnic heterogeneity, uneven educational quality, and reliance on imported menstrual products, which exposes access to macroeconomic instability.[36] Maternal education emerges as a critical determinant of menstrual knowledge, highlighting intergenerational transmission pathways of both accurate information and misconceptions.[28] Mothers and female relatives constitute the dominant information channel, positioning the household as a primary site of menstrual socialization.[24,35] However, the quality of information transmitted within this channel is often limited, with cultural norms and partial biological explanations shaping understanding. This creates a dual pathway in which knowledge acquisition occurs alongside normative restrictions, reinforcing partial awareness without empowerment.[23]

The persistence of urban-rural disparities reflects structural inequities in education, healthcare access, and exposure to reproductive health information.[24] Rural adolescent girls, particularly those in public schools and lower socioeconomic households, remain disproportionately disadvantaged. Importantly, limited menstrual literacy is not restricted to adolescent populations; evidence from university settings indicates that tertiary education does not necessarily ensure adequate menstrual knowledge when curricula fail to explicitly address reproductive health.[25] This suggests that menstrual education gaps are systemic rather than developmental.

Stigma, culture, and the gender order

Menstrual experiences are strongly shaped by entrenched cultural and religious frameworks that construct menstruation as a condition requiring concealment and restriction. High levels of menstrual stigma are evident, with a majority of adolescents expressing unwillingness to share personal spaces or items with menstruating peers.[4] Such attitudes reflect long-standing cultural beliefs regarding impurity and contamination, which function to regulate female bodily experiences within socially prescribed boundaries. Gendered differences in menstrual attitudes further reinforce the social construction of menstruation. Evidence indicates that males tend to hold less favorable attitudes than females, reinforcing the importance of engaging male populations in menstrual health education.[40] In patriarchal social systems, male perceptions significantly influence household and peer-level norms; therefore, male-inclusive interventions may be essential for reducing stigma and improving psychosocial outcomes.

Religious frameworks also play a significant role in shaping menstrual meanings and practices.[34] While religious belief systems may provide emotional support and coping structures, they may simultaneously impose restrictions that reinforce perceptions of impurity, exclusion from religious participation, and reduced self-worth. The dual role of religion as both protective and restrictive underscores the need for nuanced interpretation of religiosity in menstrual health research.

The menstrual pain-mental health nexus

A consistent positive association exists between dysmenorrhea severity and mental health outcomes, including anxiety, depression, and low self-esteem.[18,42] This relationship aligns with established biopsychosocial models of chronic pain, which suggest bidirectional interactions between affective states and nociceptive processing. Neurobiological sensitization of pain pathways and cognitive mechanisms such as catastrophizing contribute to amplification of menstrual pain experiences, while persistent pain increases vulnerability to psychological distress.[46,47] Anxiety appears to exert the strongest relative influence on dysmenorrhea severity, indicating that psychological screening may be an important component of menstrual pain management.[18,48]

Menstrual disorders are highly prevalent, with dysmenorrhea affecting between 64% and 85% of women across studies.[29,30,32,37,42] However, healthcare-seeking behavior remains low, reflecting normalization of menstrual pain as an expected biological condition.[14,15,29] This contrasts with higher treatment-seeking rates in high-income settings and indicates structural and sociocultural barriers, including limited access to healthcare services, financial constraints, and cultural minimization of menstrual pain. Despite this, the cross-sectional nature of existing evidence limits causal inference. In terms of the directionality of the menstrual pain, mental health relationship remains unclear, and reciprocal pathways are plausible but unconfirmed within the Nigerian context. Longitudinal designs are therefore required to establish temporal sequencing and clarify intervention points.

Educational disruption and life-course implications

Menstrual-related absenteeism ranges from 13% to 44% across adolescent populations.[37,43,15,14] This represents a significant cumulative loss of instructional time, with potential long-term implications for academic performance and educational attainment. Given that secondary school completion rates among Nigerian girls remain relatively low, menstrual-related school disruption may constitute an unrecognized contributor to gender disparities in education. The determinants of absenteeism are multifactorial and include pain severity, fear of stigma, lack of menstrual products, and inadequate WASH infrastructure.[33] These interacting factors highlight the importance of both biomedical and structural interventions.

Evidence from other LMICs suggests that school-based provision of menstrual products, improved sanitation facilities, and menstrual health education can significantly reduce absenteeism.[5] In Nigeria, where menstrual poverty affects a substantial proportion of women and girls, policy responses such as subsidized menstrual products, tax reductions on sanitary goods, and local production of affordable reusable alternatives represent feasible structural interventions.[2,19] However, implementation effectiveness will depend on institutional coordination and sustained funding.

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Period poverty as a structural determinant of mental health

Period poverty extends beyond product affordability to include inadequate sanitation infrastructure, limited access to accurate information, and psychosocial consequences associated with menstrual stigma.[2] Qualitative evidence highlights lived experiences characterized by financial strain, anxiety, depressive symptoms, and in extreme cases, engagement in transactional sex to secure menstrual products.[16,36,45] Within the Nigerian context, period poverty is embedded in broader structural conditions including economic inequality, weak public health infrastructure, and gender-based vulnerability. These intersecting factors position menstruation not merely as a biological process but as a social determinant of mental health and well-being.

Addressing period poverty therefore requires multisectoral interventions that extend beyond health provision to include education, social protection, and infrastructure development. The emergence of a national menstrual health and hygiene policy represents an important policy milestone; however, its impact will depend on implementation fidelity, resource allocation, and intersectoral coordination across health, education, and finance sectors.

Limitations and gaps in the existing literature

This systematic review has several limitations that should be considered. First, despite comprehensive searching, the possibility of publication bias cannot be excluded; studies with null or negative findings may be underrepresented in the published literature. Second, the heterogeneity of outcome measures across studies precluded meta-analysis, and the narrative synthesis may have oversimplified nuanced findings. Third, the exclusion of grey literature means that important data from government reports, non-governmental organization evaluations, and other non-peer-reviewed sources were not captured. Fourth, the narrow time frame (2015-2025) may have excluded relevant studies published earlier, though this was a deliberate choice to focus on the most contemporary evidence.

Critical gaps in the literature that this review identifies include: i) the near-complete absence of longitudinal studies examining the trajectory of mental health across menstrual cycles and reproductive life stages; ii) insufficient representation of women in the North-East, North-West, and South-East geopolitical zones, limiting the generalizability of findings; iii) the exclusion of women with disabilities, internally displaced persons, and women in correctional facilities from menstrual health research; iv) the lack of intervention studies - only one quasi-experimental study was identified that test strategies to mitigate the mental health impact of menstruation; and v) limited attention to the role of male partners, family members, and communities in shaping menstrual experiences and outcomes.

Strengths and limitations of the study

Strengths

This systematic review has several notable strengths. First, it employed a rigorous, transparent methodology guided by the PRISMA-SR reporting guidelines, ensuring replicability and methodological rigor. Second, the comprehensive search across six databases, combined with manual searching of reference lists and forward citation tracking, maximized the capture of relevant studies. Third, the independent dual-reviewer process for screening, data extraction, and quality appraisal minimized reviewer bias and enhanced the reliability of findings. Fourth, the thematic synthesis approach allowed for an integrative, nuanced understanding of the multidimensional relationship between menstruation and mental health, moving beyond the fragmentation of individual study findings to identify cross-cutting themes and patterns. Fifth, the inclusion of diverse study designs, quantitative, qualitative, and mixed-methods, enriched the synthesis and allowed for triangulation of evidence across methodologies. Finally, the quality appraisal of included studies using the MMAT provided transparency regarding the methodological strengths and weaknesses of the existing evidence base.

Limitations

Several limitations must be acknowledged. The exclusion of grey literature and studies in languages other than English may have introduced publication and language bias. The narrative synthesis approach, while appropriate for a systematic review, lacks the statistical precision of meta-analysis and may be influenced by reviewer interpretation. The quality appraisal, while informative, is inherently subjective and was based on reported methodological details, which were sometimes incomplete. The focus on studies published from 2015 onwards, while ensuring contemporary relevance, may have omitted foundational research that continues to inform understanding of menstrual health in Nigeria. Finally, the review was limited to peer-reviewed literature, potentially excluding valuable insights from program evaluations and community-based research conducted by non-governmental organizations.

Gaps in the literature

The review reveals several critical gaps in the literature. First and most strikingly, there is a complete absence of longitudinal cohort studies tracking the mental health trajectories of Nigerian women across menstrual cycles and reproductive life stages. Without longitudinal data, it is impossible to establish the temporal sequence of menstrual experiences and mental health outcomes or to identify critical periods for intervention. Second, the existing research is concentrated in a few geographic areas, with the North-East and South-East zones substantially underrepresented, limiting the generalizability of findings across Nigeria's diverse sociocultural landscape. Third, the literature is heavily skewed towards in-school adolescent populations, with insufficient attention to out-of-school youth, married women, working women, and women in healthcare and correctional settings. Fourth, women with disabilities, internally displaced persons, and sexual and gender minorities are virtually invisible in the menstrual health research landscape in Nigeria. Fifth, there is a dearth of intervention studies testing strategies to mitigate the menstrual-mental health burden, leaving a critical evidence-practice gap. Sixth, the role of male partners, fathers, brothers, and male peers in shaping menstrual experiences and outcomes remains underexplored. Seventh, no studies have examined the economic cost of menstrual disorders in terms of healthcare expenditure, lost productivity, and educational underachievement in the Nigerian context. Finally, qualitative studies exploring the lived experiences of women across the reproductive lifespan, rather than focusing narrowly on adolescents, are needed to understand how menstrual experiences and their mental health impact evolve over time.

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Conclusions

The findings from this systematic review reveal a consistent and alarming picture: menstrual health is fundamentally compromised by widespread knowledge deficits, deeply embedded cultural stigma, high prevalence of painful menstrual disorders, and pervasive period poverty that collectively drive significant mental health morbidity and educational disadvantage. The evidence demonstrates a clear nexus between menstrual pain and mental distress, with anxiety, depression, stress, and low self-esteem all independently and collectively associated with dysmenorrhea severity. PMS, affecting over 75% of adolescent girls in some studies, represents a substantial but unrecognized cause of mood disturbance, school absenteeism, and functional impairment. The qualitative evidence powerfully illustrates the psychosocial toll of menstrual-related shame, fear of staining, and social exclusion, particularly among rural adolescents. These findings collectively suggest that menstruation is not merely a biological inconvenience but a determinant of mental health inequity in Nigeria that demands urgent attention from researchers, clinicians, policymakers, and community stakeholders.

The geographic, methodological, and population limitations of the existing evidence base, however, counsel against overgeneralization. The field requires investment in rigorous longitudinal research, nationally representative surveys, and well-designed intervention trials to build a stronger evidence base for action. The nascent National Menstrual Health and Hygiene Management Policy provides a framework for coordinated response, but its success will depend on sustained political commitment, multisectoral collaboration, and adequate resource allocation. Addressing the mental health burden of menstruation in Nigeria is not only a matter of improving women's health but also of advancing gender equality, educational opportunity, and sustainable development. As the international community mobilizes around the 2030 Agenda for Sustainable Development, menstrual health and its mental health dimensions must be recognized as integral to the achievement of universal health coverage, quality education, and gender equality.

Recommendations

Based on the findings of this review, the following recommendations are proposed.

1. Integration of menstrual health education into school curricula: Ministries of Education at federal and state levels should incorporate comprehensive, age-appropriate menstrual health education into primary and secondary school curricula, addressing not only hygiene management but also the emotional, social, and psychological dimensions of menstruation.
2. Targeted interventions for rural and underserved populations: mobile health education campaigns, community-based outreach, and trained female community health workers should be deployed to reach out-of-school girls, rural women, and other underserved populations with accurate menstrual health information and support.
3. Addressing period poverty through multisectoral action: the Federal Government should implement tax exemptions on imported menstrual products, subsidize local manufacturing of affordable reusable products, and ensure that schools, healthcare facilities, and public spaces are equipped with functional WASH facilities and sanitary disposal systems. The newly validated National Menstrual Health Policy should be rapidly operationalized with clear funding mechanisms.
4. Strengthening mental health integration in menstrual care: healthcare providers, particularly those in primary care and reproductive health settings, should be trained to screen for depression, anxiety, and psychological distress among women presenting with dysmenorrhea, PMS, or other menstrual disorders, and to provide or refer for appropriate mental health support.
5. Male engagement in menstrual health promotion: interventions targeting fathers, brothers, male peers, and male community leaders should be designed and tested to build a supportive environment that reduces stigma and promotes gender-equitable attitudes towards menstruation.
6. Improving health-seeking behavior for menstrual disorders: public awareness campaigns should challenge the normalization of menstrual pain and encourage women and girls to seek healthcare evaluation and treatment for dysmenorrhea and other menstrual disorders, with services made accessible, affordable, and youth-friendly.
7. School-based menstrual support programs: schools should be mandated to provide emergency sanitary products, private changing facilities, pain management support, and flexible attendance policies that prevent menstrual-related school dropout while maintaining educational standards.

Implications of the study

Public health implications

Menstrual health is inextricably linked to multiple public health priorities, including adolescent health, maternal and reproductive health, mental health, and WASH-related disease prevention. The high prevalence of menstrual disorders and their documented impact on mental health and QoL suggest that population-level interventions addressing menstrual health could yield significant improvements in women's overall health status. Integrating menstrual health into existing maternal and child health programs, school health services, and primary healthcare delivery could expand the reach and effectiveness of public health efforts.

Practice implications

Clinicians, including general practitioners, gynecologists, pediatricians, and mental health professionals should adopt a holistic approach to menstrual health that addresses both the physical and psychological dimensions. Routine inquiry about menstrual experiences, pain, and associated mood changes should be incorporated into adolescent and adult healthcare visits. Pain management protocols for dysmenorrhea should include psychosocial assessment and, where indicated, mental health referral.

Research implications

This review identifies critical evidence gaps that define a research agenda for menstrual health and mental health in Nigeria. Priority areas include longitudinal cohort studies to establish causal pathways; nationally representative surveys to determine prevalence and risk factors; intervention trials to test school- and community-based programs; qualitative studies exploring the experiences of underrepresented groups; economic analyses of the cost of menstrual disorders; and research on the effectiveness of emerging digital health solutions for menstrual education and support.

Policy implications

The evidence supports the urgent need for a coordinated national response to menstrual health that extends beyond hygiene management to encompass mental health and psychosocial well-being. The National Menstrual Health and Hygiene Management Policy, recent-

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ly validated by the Federal Government, provides a framework that should be operationalized with clear implementation plans, budget allocations, and monitoring and evaluation mechanisms. Policy should address the structural determinants of period poverty, including the taxation of menstrual products, the reliance on imports, and inadequate WASH infrastructure in public institutions.

Global health implications

Nigeria, as Africa's most populous country and largest economy, has the potential to serve as a regional leader in menstrual health research and programming. Lessons learned from Nigeria, including the challenges of addressing menstrual health in a context of ethnic diversity, religious pluralism, and economic inequality are relevant to other LMICs facing similar challenges. The findings of this review contribute to the growing global evidence base on the intersection of menstrual health and mental health, supporting the case for integrated approaches that address the biopsychosocial dimensions of menstruation.

Educational implications

The finding that menstrual-related educational disruption affects a substantial proportion of Nigerian schoolgirls underscores the need for schools to become supportive environments for menstrual management. Teacher training on menstrual health, provision of sanitary products and disposal facilities, and policies that prevent menstrual-related discrimination and bullying are essential. Comprehensive sexuality education that begins before menarche and continues throughout secondary school can prepare girls for menstruation and challenge the stigma that surrounds it.

Future directions

Future studies should prioritize longitudinal research that tracks Nigerian women across menstrual cycles and reproductive transitions to clarify how menstrual health influences mental health trajectories over time. Intervention research is urgently needed to test the effectiveness of school-based menstrual health education programs, community-based stigma reduction interventions, and integrated mental health screening and support for women with menstrual disorders. Nationally representative surveys with standardized instruments should be conducted to establish reliable prevalence estimates for menstrual disorders and associated mental health outcomes across all Nigerian geopolitical zones. Future research should also specifically include underrepresented populations, including out-of-school adolescents, married women, working women, women with disabilities, internally displaced persons, and women in institutional settings. Qualitative and mixed-methods studies should explore the role of male partners, family members, and communities in shaping menstrual experiences and outcomes. Economic analyses quantifying the direct and indirect costs of menstrual disorders, including healthcare expenditure, lost productivity, and educational underachievement, are needed to build the investment case for menstrual health interventions. Finally, implementation science research should examine how to scale up evidence-based menstrual health interventions within existing health and education systems, with attention to fidelity, cost-effectiveness, and sustainability in low-resource settings.

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Online supplementary material:

Supplementary Table 1. Risk of bias assessment/quality assessment score.

Supplementary Table 2. Summary of the included studies.

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